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131. The composite bone graft of claim 129, said one or more cortical bone pins comprise locking pins located parallel to interfaces of adjacent bone portions, where one locking pin is provided at each interface of adjacent bone portions parallel to that interface, said locking pins partially traverse said composite bone graft.

REMARKS

Claims 110-139, are pending in the present application. Claims 110-115, 124-125, 129, and 131, have been amended to recite that the cortical bone portions are not demineralized. Support for this amendment appears throughout the specification and claims as originally filed. No new matter has been added.

I. *At page 2 of the Office Action, the Examiner requires a drawing of the pins located parallel to the interface of adjacent bone portions as recited by claim 131.*

Filed herewith, is new informal drawing, labeled "Figure 45," illustrating the pins located parallel to the interface of adjacent bone portions, as required by the Examiner. A formal drawing will be filed upon the indication of allowable subject matter. The specification has also been amended to include a description of this figure 45.

II. *At page 2 of the Office Action, claims 124, 125, 126/125, 127/125/125 and 131, have been rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.*

The Examiner states that claims 124 and 125 each require the bone graft to have a diameter and that this is unclear because the graft also has widths and height. A description of what is meant by "diameter" is recited in the "Detailed Description" section of the application as the measurement "84." Claims 124 and 125 have each been amended to more appropriately recite the term "length" in place of the term "diameter." Likewise, the "Detailed Description" section of the application has been amended to recite "length" in place of "diameter" in reference to measurement 84. Accordingly, this rejection as to claims 124 and 125, is overcome. The Examiner is respectfully requested to withdraw this rejection as to these claims.

Regarding claim 131, the Examiner states that claim 131 requires the cortical pins to be parallel to the interfaces of adjacent bone portions, but that claim 130 has already established that the pins are perpendicular to the interfaces. The Examiner states that it is unclear which limitation is intended. Claim 131 has been amended to properly recite that the claim is dependent on claim 129, not 130. No new matter has been added. In view of the amendment to claim 131, it is submitted that this rejection as to claim 131 is overcome. Thus, the Examiner is respectfully requested to withdraw this rejection.

III. At page 3 of the Office Action, claims 110-139 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of U.S. Patent No 6,200,347.

Responsive to the Examiners rejection, a terminal disclaimer is filed herewith. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

IV. At pages 3 and 4, of the Office Action, claims 110-114, 116-119, 128 and 132, have been rejected under 35 USC §102 as being anticipated by Boyce et al. '731.

The Examiner states that '731 teach a bone-derived implant 20 including alternating layers 22 and 23 of cortical bone demineralized to different degrees. The sources of the bone are preferably allogenic but may also include xenogenic sources. The Examiner states that the layers are bound together mechanically or with biocompatible adhesives. The Examiner states that the limitation requiring the pins to be perpendicular to an interface of the cortical bone portions, is considered to inherently be within the scope of the invention of '731 since '731 suggest the use of pins to mechanically fasten adjacent layers of the graft, without indicating a specific angle, and that therefore all angles from parallel to perpendicular are inherently included.

'731 disclose a bone-derived implant made up of one or more layers of fully mineralized or partially demineralized cortical bone and optionally one or more layers of some other material as recited in '731 at col. 4, lines 24-33.

Claims 110-114 have been amended to recite that the cortical bone portions are not demineralized. Support for this amendment appears throughout the specification and claims as filed. '731 do not teach or suggest an implant including cortical bone that is not demineralized. Claims 116-119, 128 and 132 are directly or indirectly dependent on one or more of claims 110-114. No new matter has been added. Accordingly, this rejection is respectfully traversed. The Examiner is respectfully requested to withdraw this rejection.

V. At pages 4 and 5 of the Office Action, claims 115, 120-127, and 133-139, have been rejected under 35 USC §103 as being unpatentable over Boyce et al. '731 further in view of Gresser et al.

The Examiner states that '731 teach all of the limitations of the invention except particular dimensions and shapes recited, that the top and bottom surfaces include a plurality of continuous linear protrusions defining a saw-tooth pattern and that the graft includes a through-hole which entirely traverses the graft. The Examiner states that Gresser et al teach a resorbable interbody fusion device having a top and bottom surfaces 11 and 12 which include a plurality of serrations 16 to aid in anchoring the device to surrounding bone, and that the device includes through holes 18 for the introduction of autologous bone. The Examiner concludes that it would have been obvious to one of skill in the art at the time of the invention to have formed teeth on the top and bottom surfaces of the graft of '731 so as to improve its anchorage into surrounding bone and that it would also have been obvious to have provided through-holes in the '731 invention to allow for bone ingrowth. In view of the following, this rejection is respectfully traversed.

'731 teaches an implant requiring alternating layers of bone where the bone is fully or partially demineralized. Gresser et al. require a synthetic, resorbable or bioresorbable interbody spinal fusion implant, where the surface of the implant can be serrated or threaded.

The rejected claims, as amended, all require that the cortical bone portions are not demineralized. '731 do not teach or suggest an implant including cortical bone portions that are not demineralized. In fact, '731 requires that the cortical bone portions be partially or fully demineralized. Gresser et al. do not cure the deficiencies of '731 since Gresser et al. also do not

teach or suggest an implant including cortical bone portions that are not demineralized, as required by the present claims. In fact, Gresser et al. do not teach or suggest a bone implant. Rather, Gresser et al. require a synthetic, resorbable implant.

Specifically regarding claim 115, claim 115 further requires one or more bone pins provided perpendicular to an interface between adjacent bone portions, and a first and second chamfered edge. Neither '731, nor Gresser et al. suggest one or more bone pins provided perpendicular to an interface between adjacent bone portions, and neither '731 nor Gresser et al. suggest an implant having a first and second chamfered edge, as required by claim 115. Regarding the remaining rejected claims, '731 does not suggest an implant including cortical bone portions are not demineralized, '731 does not suggest an implant having a textured surface. Gresser et al. do not cure the deficiencies of '731 since Gresser et al. do not suggest a bone implant, let alone a bone implant including cortical bone portions that are not demineralized, or bone implant including cortical bone portions that are not demineralized where the implant has a textured surface, as required by the present claims.

In view of the foregoing, nothing in '731 or Gresser et al. taken alone or together, render the claimed invention obvious within the meaning of 35 USC §103.

VI. At page 6 of the Office Action, claims 129-130 have been rejected under 35 USC §103 as being unpatentable over Boyce et al. '731 and further in view of '731's teaching.

The Examiner states that '731 teach the use of natural or synthetic materials to form mechanical fasteners such as pins, screws and that the making of such a fastener of the same material as the block 20 would be obvious in order to provide for a consistent material throughout the implant. In view of the following, this rejection is respectfully traversed.

Claim 129 has been amended to recite that the cortical bone pins are not demineralized. Support for this amendment appears throughout the specification and claims as originally filed. No new matter has been added. Claim 130 is dependent on claim 129.

‘731 do not suggest an implant where the cortical bone portions are not demineralized. Therefor, ‘731 cannot suggest a cortical bone pin where the cortical bone is not demineralized, as required by the present claims. In view of the foregoing, it is submitted that nothing in ‘731 renders the claimed invention obvious within the meaning of 35 USC §103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

It is submitted that claims 110–139 are in condition for immediate allowance and early notice to that effect is respectfully requested. The Examiner is invited to contact the undersigned at her Spotsylvania, Virginia telephone number on any questions that may arise.

Respectfully submitted,
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